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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/761,381	01/22/2004	Shinji Murai	247955US2SRD	2421
22850	7590	03/13/2007		
OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			EXAMINER TRINH, THANH TRUC	
			ART UNIT	PAPER NUMBER
			1753	

SHORTENED STATUTORY PERIOD OF RESPONSE	NOTIFICATION DATE	DELIVERY MODE
3 MONTHS	03/13/2007	ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Notice of this Office communication was sent electronically on the above-indicated "Notification Date" and has a shortened statutory period for reply of 3 MONTHS from 03/13/2007.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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<b>Office Action Summary</b>	<b>Application No.</b> 10/761,381	<b>Applicant(s)</b> MURAI ET AL.	
	<b>Examiner</b> Thanh-Truc Trinh	<b>Art Unit</b> 1753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 22 January 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>6/12/2006, 1/22/2004</u> . | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-4, 6-12 are rejected under 35 U.S.C. 102(e) as being anticipated by Gaudiana et al. (US Publication 2003/0188777).

See Figures 6 and 13.

Regarding claim 1, Gaudiana et al. disclose a dye-sensitized solar cell 600 comprising a semiconductor electrode 603 containing dye (sensitizing dye) and carboxylic compound of co-sensitizer, the dye and carboxylic compound being carried on a surface of the semiconductor electrode (See Figures 6 and 13, paragraphs [0047-0051] and [0006], or [0016-0118]; a counter electrode (or conductor 618); and an electrolyte composition (or charge carrier 606) provided between the semiconductor electrode and the counter electrode, and containing an electrolyte that contains iodine and molten salt of iodide. (See paragraphs [0080-0081], [0086]).

Regarding claims 2-3, Gaudiana et al. describe the electrolyte composition further contains a gelling agent, which is poly(4-vinyl pyridine). (See paragraph [0081]).

Regarding claim 4, Gaudiana et al. describe the electrolyte contains inorganic salt of iodide such as lithium iodide. (See paragraph [0053] or [0086])

Regarding claim 6, Gaudiana et al. describe the molten salt iodide includes iodide of nitrogen-containing heterocyclic compound, such as methylpropylimidazolium iodide, methylbutylimidazolium iodide .... (See paragraph [0080]).

Regarding claim 7, Gaudiana et al. describe the molten salt iodide includes 1-methyl-3-propyl imidazolium iodide. (See Example 12 in paragraph [0096]).

Regarding claim 8, Gaudiana et al. describe the carboxylic compound includes propionic acid. (See [paragraphs [0006] or [0116]).

Regarding claim 9, Gaudiana et al. describe the electrolyte further contains water. (See paragraph [0081])

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Regarding claim 10, Gaudiana et al. describe the content of water in the electrolyte is either 0.5 wt% or 1.0wt%, which is well within the instant claimed range of 0.01 – 10wt% . (See Examples 9, 12, 13, 14, 15).

Regarding claim 11, Gaudiana et al. describe the semiconductor electrode contains titanium oxide particles. (See paragraph [0050]).

Regarding claim 12, Gaudiana et al. describe the electrolyte composition is substantially in the form of a liquid or a gel. (See paragraph [0052]).

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

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4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
5. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gaudiana et al. in view of Wariishi et al. (US Patent 6376765).

Regarding claim 5, Gaudiana et al. disclose a dye-sensitized solar cell as described in claim 1.

Gaudiana et al. do not explicitly teach using electrolyte having viscosity-lowering agent containing at least one compound selected from the group consisting of salt of nitrogen-containing heterocyclic compound and salt of aliphatic compound.

Wariishi et al. teach using electrolyte containing salt of nitrogen-containing heterocyclic compound. (See Formula 4 and col. 8 lines 61-68 and col. 9 lines 1-16).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of Gaudiana et al. by using electrolyte containing salt of nitrogen-containing heterocyclic compound as taught by Wariishi et al., because it would provide excellent durability and photoelectric conversion properties. (See col. 1 lines 58-63).

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thanh-Truc Trinh whose telephone number is 571-272-6594. The examiner can normally be reached on 8:30 am - 5:00 pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

TT  
03/05/2007

  
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SUPERVISORY PATENT EXAMINER  
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